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Perinephritic Abscess.

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The perinephric space is that space limited by the perinephric fascia and completely external to the fibrous capsule of the kidney. It contains a varying amount of fat which is poor in blood supply.

Suppuration in this area may be conveniently discussed under the headings of primary and secondary.

The diagnosis of the secondary form presupposes disease within the kidney such as pyonephrosis, pyelonephritis or tuberculosis, or the primary lesion may be in the appendix, gall bladder, pelvic organs or vertebrae. In any of these conditions pus may enter the perinephric space.

It is not however the object of this short paper to discuss the latter group, but to review the question of primary perinephritic abscess. Probably no surgical condition gives rise to more confusion in diagnosis, particularly in its early stages, and indeed even after the stage of suppuration its recognition would not seem to be without difficulties. In a review of twenty-five cases, being the number of admissions to the Public Wards of the General Hospital for five years, one is struck with the variety of diagnoses that were made on admission. It was necessary to differentiate from such conditions as pyelitis, pyonephrosis, appendicitis, fibrositis, arthritis of the spine, Pott's Disease, Cholecystitis, typhoid fever, influenza and in one case the admission diagnosis was splenomegaly of unknown origin.

In the 26 cases reviewed, 17 cases or 73 per cent. were males and 17 per cent. were females. The majority of these cases occurred in young adults, the average age being 27. Fifty per cent. of the cases gave a very definite history of staphylococcal skin infections at varying lengths of time previous to the onset of their symptoms. In the other cases there was no mention in the records of a previous infection, but from personal experience one would say that almost certainly in all cases one may elicit such a history.

In 18 cases of the 26 the infection was a left-sided one. In 18 cases of the 26 stapylococcus aureus was cultured from the pus at operation. Three cases here noted did not come to operation, and in the other 5 cases no note had been made of a culture being taken. In only two cases was there any history of injury.

It would seem reasonable to suppose then that the individual suffers from a temporary bacteriamia as a result of his original staphylococcal infection, and that for some reason difficult to understand the organisms settle out in this perinephric space where blood supply is poor and suppuration results. Hunt and various other writers are inclined to believe, however, that the original infection is a small subcapsular abscess, which breaks through into the perinephric space In a fairly short experience one has never seen at operation any break in the fibrous capsule of the

kidney. Moreover if one presupposes the infection as having been one of renal origin primarily it is extraordinary that at least a certain percentage at any rate would not show signs of an accompanying pyelitis. It is almost the invariable rule that the urine in these cases shows no evidence of infection of the pelvis or cortex.

The usual history is one of pain coming on more or less gradually in one or other loin. Occasionally the pain is more marked anteriorly and may be mistaken for evidence of gall bladder disease. Again the pain may be referred to the right iliac fossa and with elevation of temperature etc., may be mistaken for appendicitis.

With the continuation of pain there in general malaise, weakness and occasionally chills. The most common diagnosis to make at this stage is influenza or lumbago. The average duration of symptoms in the cases reviewed was 3½ weeks. In many cases the patient was not off work for the first two weeks, and the general history was an aching pain in the loin gradually increasing in severity. Rarely is there any history of symptoms referrable to the genito-urinary tract. Neither is there vomiting or other evidence of disturbed intestinal tract.

There is a varying degree of fever as a rule being somewhat more decidedly elevated in the evening and reaching 103°F. to 104°F. There is a comparative increase in pulse rate and leucocytosis varying in the cases analyzed from 13,000 to 19,000. The pain is not particularly severe and the patient as a rule does not look severely ill.

The physical examination varies according to the size and position of the abscess. Perhaps the most constant and helpful physical finding is the splinting of the muscles in the costvertebral angle, compared to the opposite side when the patient is examined as he leans forward in the bed. In this position also one may frequently pick up a slight bulging and some degree of subcutaneous oedema. Of course in the well developed cases there will be a marked bulging and even fluctuation, but it is most satisfactory to diagnose the cases in their earlier stages.

In one case the abscess of long standing had made its way forwards and laterally until it presented an abdominal mass anteriorly which was mistaken for enlargement of the spleen. In another instance the pain and tenderness were beneath the right costal margin and a diagnosis of cholecystitis was made. The abscess may also track down anteriorly along the psoas giving flexion of the leg and a mass in the iliac fossa. The signs may be so obviously those of a renal disease in spite of the absence of urinary findings, that in nine cases of the 26, Radiological examination, and in five cases cystoscopy was carried out.

Three cases of the 26 which were definitely diagnosed as perinephric abcess subsided with treatment. From a study of these records it seems reasonable to classify them as types of phlegmonous inammation that have resolved. The remaining 23 were operated upon at intervals varying from a few hours to ten days after admission. The incision was the usual oblique one for exploration of the kidney. The size of the abscess varied from that containing two ounces to thirty ounces. In the smaller types it was necessary to expose the kidney fairly completely and search for it. In some cases it was found in relation with the upper pole but more constantly towards the lower pole. In all cases a drainage tube was inserted to the lower level of the abscess and removed about the sixth day. In one instance the abscess was found anteriorly after considerable difficulty. This case, however, ultimately developed a urinary fistula and subsequently had a nephrectomy done for multiple small abscesses. So that it is doubtful if it should come under this heading. At the original operation, however, it was considered that she had a primary perinephric abscess.

The average case was free of discharge in two weeks and was out of hospital in two to three weeks. None of those operated upon have had a recurrence of suppuration with the exception of the one case mentioned above.

In all cases of unexplained pain in the back associated with a fever of the septic type, perinephric inflammation should be considered in the differential diagnosis. The majority of such cases will end in suppuration, and after efficient drainage will make an uninterrupted recovery.

Puerperal Sepsis.

By G. HAMES, B.A., 2T9.

The problem of maternal mortality is one which has come in recent years to occupy a prominent place in the consideration of the medical profession—and indeed, one in which the public at large are manifesting increased interest and concern. There is a tendency, in focussing our attention on high mortality rates to crowd into the background the primary problem—maternal morbidity—which shows a correspondingly high rate—and which must, of course, be the point of attack in any endeavour to cope with the situation. A comparative examination of statistics the world over discloses the fact that puerperal sepsis, with striking uniformity, places a more dominant rate in the causation of maternal deaths, than any other single factor—accounting for from one-third to one-half of the total fatalities—and assuming therefor an importance in the incidence of morbidity, of which a true estimate cannot at present be arrived at due to the fact that many cases are not reported. The revaluation in our knowledge of disease and infection instigated by the work of Pasteur and Lister—and increased facilities in diagnosis and treatment, have not led to a degree of progress in dealing with puerpal sepsis, commensurate with that experienced in other fields of medicine; and the situation cannot be regarded with any degree of complacency by medical practitioners. It is the purpose of this paper to consider this difficult problem in some of its clinical aspects.

The fundamental fact in our conception of puerperal sepsis is that the disease processes met with in this connection are all primarily due to wound infection in the genital tract, occurring during labour or the clinical puerperium. The clinical features are, therefor, those which we find associated with wound infection in general—modified by the anatomical situation of the parts affected—and by certain anatomical and physiological peculiarities of the female genital system. The manifestations of the disease are exceedingly protean in nature—including a wide range of local gynecological conditions—and certain general conditions arising from wound infection and absorption therefrom. It is, therefor, in the scope of this paper impossible to enter into the minute detail of pathology and symptomatology. Rather, an attempt is made to present, in a more or less general way, the salient points in regard to etiology, clinical classification, indicating the manner in which the various conditions arise, and the diagnosis, prognosis and treatment.

Etiology.

While the main points in the etiology of puerperal sepsis are recognized, the whole story is not yet clear, and there are certain facts in regard to the incidence of the disease, the explanation of which is obscure in the light of our present comprehension of the etiology. Why, for instance, should the discrepancy exist between the incidence in rural and urban centres, the latter con-

sistently maintaining a higher level? Again, why is the incidence in private practice admittedly less than in hospital, where the patient is surrounded by a more favourable environment than the average home—and where it is easier to carry out the smallest detail in aseptic technique?

As has been indicated puerperal sepsis is essentially wound infection, and the first factor to be considered in the etiology is the nature of the infecting organism.

(a) Bacteriology.

The organisms responsible have been investigated by means of smears taken from the cervix prior to labour—and by bacteriological examinations of lochia from the vagina or uterus subsequently. Blood cultures have also been carried out in this study. The organisms found are those associated with wound infection elsewhere. Streptococci—of varied form and degree of virulence, are the most common. Staphylococcus and B. Coli occur much less frequently, and practically always in mixed infections. The gonococcus is a fairly frequent factor—being the etiological agent in about 15 per cent. of cases. A variety of putrefactive organisms also occur — giving rise to local infection, with general toxaemic manifestations. Where a blood infection occurs the streptococcus is practically the only organism isolated.

(b) Source of Infection.

This is a question which has resulted in much discussion and controversy. Semmeliveis distinguished two methods of innoculation — **endogenous** or auto infection by organisms present in the vagina, and **exogenous,** where the infecting agent is introduced from without by physician or nurse using inefficient aseptic technique, or by the patient herself handling the genitals. De Lee in discussing exogenous infection lays considerable stress on air-born infection—as by infected particles of dust settling on the field of operation. It is beyond doubt that epidemics and severe cases are due to bacteria carried into the genital tract from the outside. The bone of contention is whether those organisms frequently of normal women preceding labour may increase in virulence and give rise to infection. Baume reviews this question and presents an analysis supporting the view that in the presence of lowered resistance and unusually favourable local conditions for their growth, these organisms are able to increase in virulence and become infective. The interpretation of bacterial studies in these cases is fraught with many difficulties and no definite pronouncement can be made on this disputed point. Most authorities, however, concur in the opinion that exogenous infection is by far the more important factor, while not denying the possibility of endogenous or so-called auto infection.

Another source of infection should be kept in mind as a possible origin of the bacteria—namely, focal infections elsewhere in the body, from which organisms might pass by the blood stream to the genital tract.

(c) Predisposing Causes.

1. Those directly associated with pregnancy and labour.

(i) Complications of pregnancy:
Toxaemias.
Accidental haemorrhage.
Placenta praevia.
(ii) Prolonged exhausting labour.
(iii) Intrauterine manipulations.
(iv) Operative interference.
(v) Excessive local trauma.
(vi) Retention of placenta or membranes.
(vii) Undue haemorrhage.

2. General Conditions:

Any condition which keeps the patient's health below par lessens her ability to withstand infection. Therefor those suffering from affections of the heart, kidney or respiratory system face a greater risk.

Classification.

Although the underlying cause of all forms of puerperal sepsis is recognized as wound infection—the great diversity in the manifestations renders satisfactory classification a difficult problem. In each case, we are interested in the site of entrance of the infection—its extent—the kind and degree of virulence of the etiological organism—and the mode of extension of the infection from its primary site. As yet, an ideal classification indicating all this information has not been arrived at. It has been proposed to classify the types of infection according to the organism found. This has not proved satisfactory for several reasons. In the first place a single organism is not always responsible for the pathology and symptoms present — mixed infections occurring frequently. Moreover—some organisms vary greatly in virulence—and the same organism may produce various forms of the disease, and, it is not always possible to isolate the organism which is responsible. Knowledge of the organism present, however, may have an important bearing on the prognosis — which will be considered later.

A classification which is more satisfactory clinically—and which is more convenient for purposes of description, is one based on the anatomical location of the primary lesion and the spread of the inflammation from such primary sites.

In the first division of such a classification we have then.

I. (a) Infected lacerations of
  (i) the vulva
  (ii) the perineum
  (iii) the vagina
  (iv) the cervix

(b) Infection of the placental site and the endometrium.

II. In the second division are grouped infective processes arising as the result of spread of the inflammation to the surrounding tissues.

(a) Spread by direct continuity of surface may give rise to
  (i) Salpingitis
  (ii) Ovaritis
  (iii) Peritonitis.

(b) By lymphatics
  (i) Infection of uterine wall
  (ii) Lymphangitis
  (iii) Pelvic Cellulitis
  (iv) Peritonitis—localized to pelvis —or general.

(c) By Blood Vessels.
  (i) Metrophlebitis
  (ii) Phlebitis of pelvic and crural veins—referred to as phlegmasia alba dolens.

III. Finally there are certain general conditions arising from local infection.
  (i) Toxaemia
  (ii) Septicaemia
  (iii) Pyaemia

The conditions listed here, of course, do not occur as distinct clinical entities. All local infections are accompanied by some degree of toxaemia and others by a mild or severe bacteremia and various combinations of the local conditions are met with.

A study of the condition of the genital tract following delivery, and the series of retrogressive changes which occur subsequently in an endeavour to restore the tissues to their non-pregnant state—throws considerable light on the manner of development of puerperal infection. During pregnancy all the pelvic organs are hyperaemic—and the tissues of the genital tract are hypertrophied and softened. Likewise the pelvic cellular tissue is increased in amount and its texture looser and softer. All the tissues, therefor, are in a condition rendering them more susceptible to the trauma of labour—especially severe in prolonged difficult cases — and where operative interference is necessary. Due to the distension and pressure exerted by the passage of the child's head—the vulva—perineum and vagina are found to be oedematous, hyperaemic — and extravasations of blood and serum occur. Superficial

lacerations and abrasions are common —and in difficult operative cases deep lacerations of the cervix and perineum —involving the vagina—are apt to occur.

The membranes separate through the spongy layer of the decidua—leaving the interior of the uterus with a rough, uneven surface—to which adhere tags of decidua and blood clot. The superficial portions become necrotic and are separated from the underlying healthy tissue by a zone of granulations and leucocytic infiltration. This necrotic tissue is cast off in the lochia leaving a smooth surface, covered by the deepest layers of the muscular stroma, containing the stumps of the tubular glands from which the new epithelium is regenerated. At the placental site, large venous channels occur, closed by superficial thromboses. The interior of the uterus is thus seen to be virtually equivalent to a large open wound. Decrease in size of the uterus is surprisingly rapid, involution being due to contraction and retraction of the muscle and degeneration and absorption of excess cytoplasm of the muscle fibres. Retention of membranes or placenta interferes with the process of involution, and affords an additional nidus for the growth of bacteria.

The pelvic cellular tissue also suffers from trauma, and is bruised and oedematous, extravasations of blood may occur here also.

From this brief résumé, it is apparent, that given the introduction of organisms, conditions are exceptionally favourable for the development of infection locally, and for the spread of the inflammation to the surrounding tissues.

Infection of the vulva and perineum develops at the site of lacerations or abrasions, or around the stitches where a perineorraphy has been done.

Likewise in the vagina the lesions are usually localized to abrasions, but where much pressure has been exerted a more general superficial vaginitis may ensue.

The cervix is also a common site for lacerations which become infected, and this is the commonest primary source from which pelvic cellulitis develops.

The endometrium is the commonest local site of infection in puerperal sepsis, which is not surprising when one remembers its condition subsequent to delivery. The infecting organisms may be directly introduced by intra uterine manipulations during labour. They may spread up from the lower part of the genital tract after delivery, or be introduced by ill advised local interference. The possibility of infection arising secondary to a focus elsewhere in the body is also to be considered.

Salpingitis and ovaritis may develop as a result of direct surface extension from the uterus, in which case the gonococcus is usually responsible. They are more commonly involved by extension from pelvic peritonitis, or where there has been a severe lymphatic infection.

Peritonitis is one of the most serious complications of puerperal infection, both as regards life and future health. It may be diffuse, or localized to the pelvic peritoneum, depending on the virulence of the organism and on the manner of innoculation. The disease may arise by surface extension through the tubes, usually gonococcal in nature. Or the path of infection may be by a lymphangitis through the wall of the uterus. It may also arise following infection of the lacerations of the cervix and upper part of the vagina. Rupture of a pus sac or pelvic abscess into the general cavity leads to a diffuse peritonitis, as may also perforation or rupture of the uterus itself. Localized peritonitis results in collections of pus, the most common site being the pouch of Douglas.

Pelvic cellulitis arises most commonly following infection of lacerations of the cervix. It will be remembered that the lymphatic drainage here is through the lymphatics at the base of the broad ligament laterally to the iliac glands. The resulting exudation may extend along one of the planes of the pelvic

cellular tissue the most usual tracks being laterally to the iliac fossa, posteriorly along the uterosacral ligament, or anteriorly around the base of the bladder and up on the abdominal wall.

The large venous channels in the uterine wall, we have seen, are partly closed by superficial thromboses. Should these become infected a thrombo phlebitis develops, which may spread beyond the uterus to the pelvic veins, with signs of pelvic inflammation, or even farther, involving the crural veins, giving rise to the painful white swelling referred to as milk leg. Here the phlebitis is not the only factor—a perivascular lymphangitis usually accompanying. The dangers of this complication are embolism and general blood stream infection.

Septicaemia may be lymphatic or vascular in origin. The former type is usually due to a virulent streptococcus, or where local interference has lead to the breaking down of the protective leucocytic barrier. Septicaemia, however, may arise by lymphatic absorption from any local focus in the genital tract, and an apparently insignificant local lesion may be associated with a very severe general infection, in the presence of a virulent streptococcus. Septicaemia of vascular origin is usually associated with thrombophlebitis, though here pyemia is a more common complication. This condition is one of the most dangerous met with in connection with wound infection anywhere. It arises in thrombo phlebitis where suppuration occurs, and infective emboli are carried by the blood stream to various parts of the body with the development of metastatic foci of infection.

Diagnosis.

Every case presenting a rise of temperature in the puerperium calls for a careful and thorough investigation to determine the cause of the fever. The question arises at once as to whether or not such a rise in temperature is an indication of puerperal infection. If the rise is above 100° F. on two successive occasions it is to be considered due to this cause until proved otherwise. A final diagnosis of sepsis, however, is not justified until all other possible explanations of the fever have been excluded. A careful history and physical examination are therefore necessary.

In the history certain definite information is to be looked for. One wishes to know the date in the puerperium on which the fever first manifested itself. In the majority of cases symptoms first appear from the 3rd to the 5th day of the puerperium — earlier or later depending on the virulence of the organisms. An exception occurs in the case of gonococcal infections which are characterized by their development late in the puerperium. The type of delivery also yields valuable information, for we have learned that this has an important bearing on the degree of local resistance. One should inquire then as to whether labour was normal, or whether labour was difficult, necessitating instrumental interference or internal manipulations. In this way some indication is gained of the degree of trauma which the genital tract has suffered, and the possibility of infective organisms having been introduced. In this respect also, one wishes to know if the placenta was delivered spontaneously, or by other means, and whether any undue haemorrhage occurred following delivery.

Moreover, it is desired to know the patient's past history and her condition previous to labour. It may happen, in certain cases, that an infection has preexisted and has been fired up anew under the strain of even a normal labour.

In the physical examination each system must be thoroughly investigated. The breasts should first be examined for any signs of inflammation, as this is the most common cause for a rise in temperature in the puerperium. Tonsils and the nasopharynx are also frequently the sites of inflammation, which may cause fever. The abdomen is perhaps

the next site where one looks for inflammatory trouble. Here pyelitis is a fairly common cause. This condition occurs frequently during the latter half of pregnancy and may be carried over into the puerperium. Tenderness and swelling in the kidney region—chills are suspicious—and a microscopic examination of a catheter specimen of urine for pus cells will usually clear up the diagnosis as to this point. Where catheterization has been done the possibility of a cystitis should be kept in mind.

The heat regulating mechanism of the body appears to be more unstable during the puerperium than under ordinary conditions. Indiscretions in diet and constipation may cause a marked rise in temperature, which, however, falls rapidly following correction of these errors. Emotional strain is also said to cause a rise in temperature in some patients but this at the most is very evanescent.

In physical examination the pulse is a valuable guide, and as a rule is more reliable than the temperature. In the absence of unusual haemorrhage and exhaustion a persistently rapid pulse practically always means infections. The chest must also be examined for any infection.

Having excluded all the above possibilities as a cause, one is now justified in ascribing the fever to infection in the genital tract, which is subjected to a similar thorough investigation.

The external parts should be inspected for infected lacerations. The lochia should be examined in regard to odour—presence of tissue fragments—amount. In the presence of saprophytic infection the lochia is as a rule profuse, of foul odour and contains necrotic debris. Severe pyogenic infections, however may occur with very little changes in the lochia. Infection in the uterus is always associated with a delay in involution, and on abdomial examination the uterus is found to be larger than expected for the day of the puerperium. In consistency it is softer than usual, and is tender to palpation.

Having located the infection in the genital tract the question arises as to its exact site and extent. For the most part, the various conditions occurring present fairly definite and characteristic manifestations, so that when fully developed, they present no marked difficulty in diagnosis. By a process of elimination one can locate the infection in the uterus when it is confined here.

Early in the puerperium nothing is gained by a bimanual examination, and in some cases harm may be done. Infection may be carried into the uterus from the lower portion of the tract, or localization of inflammatory processes may be interfered with. Later on such an examination yields information regarding any inflammatory masses in the pelvis, or distortion and fixation of the pelvic organs.

The question of the organism responsible for the infection has also been investigated. In this respect smears are taken from around the vaginal orifice and just inside. De Lee advocates bacteriological examination of samples of lochia taken from deep in the vagina. Williams states that he makes a routine in all cases of infection—to examine specimens of discharge taken from the interior of the uterus under aseptic precautions, maintaining that only in this way can precise information be gained as to the bacterial content of the uterus. From the point of view of diagnosis, the value of such examinations appears to be problematical. Where an organism is found in almost pure culture, or greatly overshadowing in growth all others it may be presumed with some justification to be the etiological agent. But the fact that certain organisms are identified in the lochia is not sufficient evidence that they are responsible for the pathological conditions. Nor have we as yet any precise means of estimating the virulence of bacteria.

Blood cultures are also a part of in-

vestigations to determine the causative organism. They are significant only when positive, and are of secondary importance from a diagnostic standpoint, though of value in prognosis, the demonstration of a streptococcus indicating a more serious outlook.

The clinical course of the disease gives some indication of the organism at fault. The majority of cases are due to some form of streptococcus. The very severe, and the fatal cases are practically all due to this organism, alone—or in combination. Staphylococcus and B. Coli produce more localized forms of the disease, rarely giving rise to blood infections. Infections appearing late in the puerperium are nearly always due to the gonococcus.

The puerperal woman, of course, is also subject to intercurrent infections, which may lead to some confusion in diagnosis.

Prognosis.

In giving a prognosis in any case several factors demand consideration. The first of these is the (a) **site and extent of the lesion.** In respect to life, favourable prognosis as a rule is warranted in vulvo vaginal infections, uncomplicated endometritis, pelvic cellulitis and peritonitis, and uncomplicated thrombophlebitis. As to future health, in certain of these cases, notably infection of the appendages, the endometrium and pelvic peritoneum, the outlook is not so favourable, and the large majority of gynecological invalids date the onset of their ill health and disability from a confinement complicated by infection. Pyaemic and general peritonitis are the most fatal forms of the disease, septicaemia also showing a very high mortality rate.

(b) In the second place, the **form and virulence of the infective organism** has considerable bearing on the ultimate course of the disease. As has been noted the streptococcus is responsible for practically all the fatal and very severe cases. Streptococci however present many strains and degrees of virulence, and may cause any of the forms of puerperal sepsis. The gonococcus does not tend to produce a diffuse or general infection and therefor a more favourable prognosis in regard to life can be given.

(c) The next factor is perhaps the most important, and concerning which it is difficult to form an estimation, the **resistance of the patient.** This is influenced by the previous health of the patient. A woman suffering from disability due to heart, lung, or renal infections, is plainly less able to stand the strain on her reserves of a labour complicated by infection. Clinical experience and records have shown, that women who have suffered any of the abnormal conditions associated with pregnancy, or who have been exhausted by prolonged, difficult labours, with much local trauma, or undue haemorrhage are much less able to withstand infection.

The clinical features of the case to some extent, indicate the degree of resistance being offered to the infection. Burne gives a review of some 250 cases, which seem to show that the earlier the infection develops in the puerperium the greater is the severity and the mortality rate. Where fever is continuously high and prostration extreme, the outlook is also more serious. The pulse is a very sensitive indication of the gravity of the infection. In the above series of cases, in those with a pulse rate under 110 the mortality was only four per cent, and as the rate increased beyond this the mortality figure steadily followed. The degree of pyrexia had not nearly so much prognostic significance in the same series.

Treatment.

In the treatment of puerperal sepsis prophylaxis plays a role of paramount importance. High maternal mortality rates and correspondingly high incidence of morbidity associated with pregnancy, emphasize only too strongly the risk to life and health to which women are exposed in bearing children;

and external care and the conduct of labour under safe and hygienic conditions occupy a well-merited, prominent place in the field of preventive medicine.

In the prevention of this disease, three cardinal principles, corresponding to the three chief factors in the etiology, are to be kept in mind.

1. Preservation of general resistance.

We are prone to speak glibly of the resistance of the patient and the virulence of the infective organism, though the majority of us probably have a very vague conception of the laws of immunology underlying these factors. We do know, however, that in a general way, an individual's susceptibility to infection varies with the degree of health enjoyed. Therefor every endeavour must be made to maintain the expectant mother's health at the highest level possible.

In this respect, prenatal supervision is of great importance, in detecting conditions detrimental to the mother's health, such as cardiac, renal and lung affections, and foci of infection in the common sites. Here also special conditions associated with pregnancy, such as the various toxaemias, may be anticipated, and efficiently dealt with when they manifest themselves. Moreover, abnormalities of the genital tract or the foetus, likely to result in difficult and exhausting labours, are recognized in advance, and hence are more readily handled. Labour should be allowed to proceed in as nearly a physiological manner as possible, with a minimum of interference and manipulation, and shock and haemorrhage limited as far as possible. Subsequent to delivery the patient must be assured absolute rest, physical and mental, and adequate nourishment.

2. Preservation of local immunity.

Reference has already been made to the significance of wounds in the development of puerperal infection. The obvious thing then is to limit as far as possible the trauma associated with labour. A certain degree is inevitable, but strict adherence to sane indications in regard to interference with the normal physiological course of labour, in the way of undue haste or operative manipulations, is the easiest way of keeping trauma down to the minimum. The membranes should be examined to be sure they are intact, and severe lacerations repaired at once. The vulva is then to be covered with a sterile pad and considered as an open wound, no internal examinations being carried on, except in the case of haemorrhage.

3. The third principle in prophylaxis is the prevention of infection of unavoidable wounds. Unfortunately there is at present no means available of disinfecting the vagina prior to and during labour, so that it is impossible to prevent infection with organisms already present in the vagina. Our efforts are therefor directed towards preventing introduction of organisms from the outside—that is, from the external genitals or on the hands or instruments of the accoucheur.

The details of the strict aseptic technique indicated need not be entered into here.

Curative Treatment.

This has for long been the most controversial question in regard to puerperal sepsis, and no therapeutic method has given rise to a greater diversity of opinion than the local treatment of this disease, especially as applied to the uterus itself. In reviewing the literature on this subject one is struck by the great variety of the procedures which have been advocated, and appalled by the array of negative results. The obvious conclusion to be drawn, is that the treatment is far from being standardized and that there is no panacea for the cure of the ills of the woman suffering from puerperal sepsis. The aim of the variety of procedures adopted has been a direct attack on the infecting organisms, and the removal of septic material from the uterus. Theo-

retically such procedures would appear to be rational, but experience has demonstrated that not only do they fail to accomplish their purpose, but in many cases they are accompanied by disastrous results to the patient.

Among the many methods employed —intrauterine douches have had considerable vogue. These, for the most part, have been antiseptic solutions. If such douches are used with the idea of disinfecting the interior of the uterus, they undoubtedly fail, for experiment has shown that the killing power of antiseptic solutions in the test tube are not duplicated when applied to the body tissues where their action is modified by tissue fluids and the tissue cells themselves. In fact solutions of sufficient strength to kill organisms are known to also damage tissue cells and hence aid in lowering the local resistance. Moreover the solutions have very little penetrating power, and therefor, at best, exert only a superficial effect. A more rational argument for the use of the douche is to clear out debris and to promote free drainage, and for this purpose saline douches are efficient. Williams advocates the removal of samples of lochia from all patients with infection, followed by an abundant saline douche. If streptococci are found he suspends all local treatment, but in the presence of a putrid endometritis, the douche is repeated if necessary. Habhs claims good results from the injection of pure glycerine into the uterine cavity, his argument being, that due to its hygroscopic properties, the glycerine promotes a flow of lymph towards the uterine cavity, where its bactericidal action is exerted against the infection.

Like all other manpulations in the uterus at such a time, the use of douches is attended by some danger. Infection may be carried into the uterus from lower down in the tract. The leucocytic barrier may be disturbed and the infection disseminated beyond the uterus. The use of antiseptic solutions such as bichloride and carbolic acid, have led to poisoning, a series of fatal cases being published in the literature.

Swabbing out the uterus with gauze or digital removal of septic material are open to the same objection as curettage, though to a lesser degree. The use of the curet in the past has been greatly abused and irrational, but at the present time, its employment as a means of dealing with a septic uterus, is almost universally and unequivocally condemned. In many severe infections there is very little that could be removed, and all that is done is to superimpose more trauma on an already damaged uterus. Even in the presence of considerable amount of diseased tissue, one could not hope to remove it all in this way, and by the manipulations the protective zone is broken, and an infection hitherto confined to the surface transformed into a more widespread and serious condition.

The local treatment, as far as the uterus is concerned, therefor, has in recent years, undergone a radical change, and a very conservative attitude is maintained by most authorities, haemorrhage being considered the only justification for intrauterine manipulations.

The only other form of local interference in the genital tract is the evacuation of an obvious abscess. Where infection has occurred in a perineorraphy wound the stitches are at once removed and free drainage established. A pelvic abscess should be opened as soon as diagnosed. The commonest factor in the development of such an abscess is pelvic peritonitis, and the most frequent location, the pouch of Douglas. In the early stages pelvic peritonitis and pelvic cellulitis are not to be distinguished readily, and the treatment is expectant. Besides the general treatment applicable in all cases, local heat is applied by means of the electric cradle or hot vaginal douches The exudate in pelvic cellulitis usually clears up by resolution, but may go on to suppuration. Where the abscess in pelvic peritonitis occurs in

the pouch of Douglas, it is opened and drained through a posterior colpotomy. In the case of suppuration in pelvic cellulitis, the abscess may point in one or other fornix or in the iliac fossa just above Pouparts ligament. In the former drainage is established per vagina, and in the latter through a small abdominal incision, and also per vagina if necessary.

Salpingitis is also treated expectantly in the acute stages, by rest and local heat; operation for removal of pus sac being contraindicated in the acute stage.

Where a general peritonitis has developed a fatal result is practically certain. Here we are not dealing with the same situation as in peritonitis associated with ruptured ulcer, for the focus cannot be removed. The question of operation in the face of the high mortality is a disputed one. Those opposing it do so on the grounds that, since recovery is almost certainly hopeless, the surgical procedure is reflected upon. However, the only hope of recovery lies in operation and drainage, and the patient should be given this chance, the family or friends being acquainted with the probable outcome.

In view of the comparatively slight degree of success attending attempts at direct attack on the infection by local treatment, the general management and nursing care of patients suffering from puerperal sepsis assumes an important position in combatting the disease, and every endeavour must be made to build up the general resistance. The patient should be isolated in a quiet, well ventilated room, and propped up in bed in Fowler's position. This facilitates drainage from the uterus, and in the event of peritonitis supervening, aids in limiting it to the more resistent pelvic peritoneum. Except in mild cases, the child is not allowed to nurse, the act being disturbing and tiring for the mother. In brief, this aspect of the treatment is purely symptomatic, and aims at procuring absolute physical and mental rest, by the elimination of disquieting symptoms. Sedatives for pain and sleeplessness may be required. The bowel action must be regulated, constipation, diarrhoea or distention being relieved. Attention to the diet is important, plenty of nourishing, easily digested food being supplied. Quinine in small doses, 2 or 3 times daily has been recommended as a tonic. In association with ergot or pituitrin it aids in promoting better contraction of the uterus, by which retained products are expelled and absorption lessened.

Attempts to combat the toxaemia and septicaemia occurring as part of puerperal sepsis by more or less specific means require mention. These include the intravenous or subcutaneous injection of antiseptic substances and the use of antistreptococcic sera and vaccines. Bourne, in his book on recent advances in antiseptics and gynecology reviews this aspect of the situation. The use of antiseptics, such as ensal, carbolic acid, flamine, etc., he dismisses with the statement "that antiseptics injected into the blood stream can have no beneficial effects on septicaemia." He goes on to quote investigators who have had some success with the use of drugs of the salvarsan and neosalvarsan group.

Vaccine therapy has also been unattended by success.

The use of antiseptococcic sera, so widely practiced, and from which so much was expected, has been disappointing in the main, though opinion varies markedly as to their efficacy. De Lee advocates their use in increasing doses up to 100 cc for 3 days, following which they are discontinued if improvement is not apparent.

Two additional procedures deserve mention here, blood transfusion and injections of normal saline, which have beneficial results in some cases. The former may reinforce the natural immunities of the patient's blood, especially where haemorrhage has occurred,

while the saline in a way which is not altogether understood, seems to offset to some extent the effect of bacterial toxins.

Finally, we may refer to certain surgical procedures which have been resorted to. The first of these is hysterectomy of an infected uterus, first performed in 1886 by Schultz. The second is ligation of the pelvic veins in pyaemis, an operation dating back to 1784, when John Hunter performed it. The first difficulty that arises is in the choice of cases, for owing to the vagaries of the disease we have no way of knowing which cases will recover without such severe methods of treatment. Moreover the effect of such radical procedures on a patient already profoundly ill will be readily appreciated. In its present state, therefor, surgical intervention of this nature has a very limited field in the treatment of puerperal sepsis.

Summary.

1. Puerperal sepsis is the most important single factor in maintaining present high maternal mortality rates.

2. All forms of puerperal sepsis are primarily due to wound infection in the genital tract.

3. In the development of puerperal infection local trauma and the introduction of organisms from the outside are the two main factors.

4. A rise in temperature above 100°F. on two successive bi-daily readings, occurring in the clinical puerperium is to be considered as due to infection in the genital tract until proved otherwise. A positive diagnosis of sepsis should be made only following a careful history and complete physical examination to exclude other possible explanations of the fever.

5. Treatment.

(a) prophylaxis is the most important consideration.

(1) Maintain patient's general health —antenatal supervision.

(2) Restrict local trauma as far as possible.

(3) Practise strict asceptic technique.

(b) Curative Treatment.

(1) Local intrauterine manipulations are contraindicated, except where necessary to control haemorrhage.

(2) Obvious abscesses are to be evacuated.

(3) General treatment is symptomatic in nature aiming to provide mental and physical resistance in every way.

(4) Specific treament.

(a) Vaccines are of little value.

(b) Antistreptococcic sera are attended by improvement in some cases and should be tried.

(c) Intravenous antiseptics are ineffectual in septicaemia. Drugs of the Salvarsan group are of value in certain cases.

(d) Blood transfusions, especially where haemorrhage has occurred, are of value.

(e) Intravenous or subcutaneous saline injections combat toxaemia.

(5) Surgical Intervention in the nature of hyperectomy or ligation of pelvic veins is not justifiable.

Some Common Mistakes in the Diagnosis and Therapy of Diseases of Children.*

By ALAN BROWN, M.B.,
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"It is written that there 'abideth faith, hope and charity, these three, but the greatest of these is charity.' And so in medicine we have diagnosis, which is a matter of faith; prognosis, which is a question of hope; and treatment, which is only too often an affair of charity; but the greatest of these is diagnosis. For, without accurate diagnosis, it is impossible to forecast the course and outcome of a disease or to treat it satisfactorily. Indeed, as someone has truly said, 'the first part of treatment is diagnosis, and the second, diagnosis, and the third, diagnosis.' I need make no apology, therefore, for directing your attentionu to some reflections on such an important subject on this occasion." (Hutchison. R., Brit. M. J., 1928, i, 335).

A review of the records of our hospital reveals the fact that certain diseases are very frequently overlooked by the physician in charge of the patient before his admission to the hospital. In the succeeding paragraphs your attention will be directed to those conditions, and the essential points in their diagnosis and treatment will be considered briefly, beginning first with newborn infants.

Hæmorrhagic Disease of the New-Born.

This disease is characterized by spontaneous hæmorrhage from one or more parts of the body, and is of unknown etiology.

The hæmorrhages occur most frequently from the gastro-intestinal tract as evidenced by bloody stools or vomited blood. The blood may be tarry, dark brown, or bright red. The next most frequent site of bleeding is the umbilicus. In occasional cases the bleeding may be intracranial, or may occur from the nose, conjunctiva, or under the skin. The bleeding and clotting time is usually prolonged, though in some instances it may be normal. The most frequent time of onset is the third day of life. The condition occurs with decreasing frequency, until it is practically never encountered after the twelfth day. Hæmorrhages at this late date are usually the results of general sepsis or syphilis. The treatment consists in the immediate transfusion of 15 c.c. per pound of body weight of whole blood. The blood of ungrouped donors should not be used. If facilities are not available for transfusion the intramuscular injection of a total of 20 to 40 c.c. of ungrouped blood may be given at three or four different sites.

Cyanosis in the New-Born.

Cyanosis in the new-born may resnlt from atelectasis, intracranial hæmorrhage, congenital defect of the heart, or enlarged thymus. Atelectasis, which is an incomplete expansion of the lungs, usually occurs in premature or debilitated infants. The cyanosis is intermittent. Examination of the lungs frequently disclose nothing abnormal, unless the atelectasis occurs in a portion of one lung over which area a diminished air entry can be distinguished. The treatment consists in stimulating the infant to cry vigorously at frequent intervals. Intracranial hæmorrhage usually results from the tearing of blood

* Read at the 59th annual meeting of the Canadian Medical Association and published in the J.C.M.A., September, 1928.

vessels in the falx or tentorium. In mild cases the only symptoms are slight drowsiness and refusal to nurse properly. In the more severe cases there may be convulsions, as well as interference with the pulse and respirations. The cyanosis is usually constant. The only treatment is repeated lumbar puncture to drain off the blood. Congenital heart defects can be recognized on routine examination of the heart. Cyanosis, if due to a heart defect, is constant. There is no specific treatment. Cyanosis due to an enlarged thymus is intermittent.

Enlarged Thymus.

This condition is due to a hypersecretion of an enlarged thymus gland. The most frequent symptoms of the conditions are, sudden attacks of cyanosis, or pallor, breath-holding spells, convulsions, and slight difficulty in breathing similar to that produced by a mild degree of laryngeal obstruction. In newborn infants this difficulty in breathing may be so marked in the severe cases that the symptoms resemble asthma. Although retrosternal dullness may be detected at the level of the first and second intercostal spaces, a definite diagnosis can only be made by means of an X-ray plate. In infants with only slight enlargement the shadow will extend just past the lateral borders of the sternum, while in marked cases the shadow will extend many centimeters on each side of the mid-line. At the present time we do not know the exact variations in the size of the gland. but we do know that infants with only a slight enlargement have very mild symptoms if any. We have never seen a severe or fatal case without a marked enlargement of the gland. Care must be taken in the diagnosis of enlarged thymus, as at the present time there is a tendency to consider many unexplained symptoms as due to this disease. The treatment consists in repeated exposure to X-rays, and this, to the best of our knowledge, will absolutely cure the condition.

Inanition Fever.

Inanition fever occurs in new-born infants, and is due to a lack of fluid intake at a period when the heat-regulating mechanism is unstable. The objective symptoms are, fever, excessive initial loss of weight, some loss of elasticity of the skin, dry mucous membranes, and frequently an odour of acetone on the breath. The condition usually occurs during the third, fourth or fifth day of life in those cases in which the breast milk supply has not yet been established. The treatment consists in a rectal irrigation of water, and the administration of a suitable artificial feeding, until a sufficient supply of breast milk is available. The temperature will drop in the course of a few hours. Care must be taken not to mistake an infective process for this condition.

Pyloric Stenosis.

Pyloric stenosis is a marked hypertrophy of the circular muscle fibres of the pylorus, which results in narrowing and sometimes almost complete obliteration of the lumen. The objective symptoms are, projectile vomiting, visible gastric peristalsis, constipation, diminished secretion of urine, and loss of weight. A tumour may be palpated in the right hypochondriac or epigastric regions. To accomplish this, considerable time and care are frequently required. Food or water should be offered to the infant during the procedure to produce relaxation of the abdominal muscles. About 75 per cent. of our cases occurred in male infants. The first symptoms of the disease usually appear during the second, third or fourth week of life. Only 11 per cent. of our patients vomited at birth, while the maximum age at onset was seventy days. The treatment consists in immediate operation. This is followed by a simple transfusion. Post-operative treatment consists in raising the foot of the bed until the patient recovers from the anaesthetic. The infant is

then turned on the right side and the head raised. Half an ounce of breast milk should be offered four hours after the operation, and the amount increased by a quarter of an ounce every four hours until the caloric requirements are fulfilled.

Tetany.

Tetany is caused by a deficiency in the diet of the antirachitic substance, or vitamin D, which results in a reduction of the blood calcium. Convulsions are the predominant symptom. In certain cases they may occur as often as thirty or forty times a day. The next symptom, and one which is almost invariably overlooked, is a peculiar inspiratory crow, produced when the child cries. Chvostek's sign, which is a contraction of the facial muscles elicited by tapping the side of the cheek, is almost invariably present in infants with tetany. It is due to a hyper-irritability of the facial muscles. This sign is of no significance in infants over two years of age. A characteristic position of the hand (carpopedal spasm) is present in a moderate percentage of cases. Sometimes this position of the hand may be produced by a constriction of the arm for one or two minutes, and when the spasm is produced in this manner it is called Trousseau's sign. The before-mentioned five symptoms of tetany, namely, convulsions, laryngospasm, Chvostek's sign, carpopedal spasm, and Trousseau's sign are all due to hyper-irritability of the neuro-muscular system.

The age incidence and seasonal incidence of tetany are singularly striking. Of the cases encountered in the hospital during the past five years 80 per cent. occurred at the fifth, sixth, seventh, eighth and ninth months of age; and 85 per cent. occurred in the months of January to May inclusive, the highest incidence being in March and April.

In regard to treatment the convulsions may be controlled by the administration of 15 to 25 c.c. of a sterile 8 per cent. solution of magnesium sulphate injected subcutaneously. As the convulsions are a result of the low calcium content of the blood, calcium chloride should be given. The amount should be 15 grams four or five times a day for the first two days; then the number of doses should be reduced to three a day. This should be continued for three weeks. The calcium chloride may be dissolved in a little water and placed in the feedings. Cod liver oil should be started, 1 drachm t.i.d., and continued for a long period. If possible the infants should be exposed to the direct rays of the sun.

Scurvy.

Scurvy is caused by a deficiency in the diet of the anti-scorbutic substance called vitamin C. The symptoms of scurvy are pain on being handled, bleeding and swelling of the gums around the teeth, blood in the urine or stools, and swelling at the ends of the long bones. The swelling is due to a haemorrhage under the periosteum. This at first may appear as a swelling of the joint which often leads to mistaken diagnosis of arthritis of rheumatic origin. Enlargement of the costo-chondral junctions is also present, but the enlargement is more angular than that found in rickets. Seventy-five per cent. of the cases encountered in this hospital occurred in infants from 8 to 12 months of age. It is rarely seen in those more than one and a half years of age, which is of considerable value in the differential diagnosis of scurvy and rheumatic arthritis as the latter condition is practically unknown under three years of age. The treatment consists in the prolonged administration of one half to one ounce of orange juice twice a day. This may be added drop by drop to the cold feeding. If diarrhœa is produced, twice the amount of canned tomato juice may be used. Every infant more than five months old should receive at least two drachms of orange juice a day as a prophylactic measure.

Intussusception.

Intussusception is an invagination of the bowel within itself. It usually starts at the ileo-cæcal valve. The outstanding symptom is sudden onset of pain in a previously healthy infant. The parent can generally remember the exact time of the onset of the symptoms. Vomiting begins, and usually after the passage of one normal stool, the typical red currant jelly stool appears. This consists of mucus and blood. Rarely the stool may consist almost entirely of mucus with only a little blood. Examination of the relaxed abdomen reveals a sausage-shaped tumour, usually lying transversely across the upper part. It is frequently necessary to give a little anæsthetic to produce relaxation. Rectal examination will disclose the typical stool, and if the condition has been present long enough the head of the intussusception may be felt. In a few hours shock-like symptoms appear, due to the absorption of toxins from the obstructed bowel. Sixty-five per cent. of cases occur in infants from four to ten months old and only an occasional case in children over eighteen months of age. The treatment consists in the immediate reduction of the tumour by an abdominal operation. A delay of a few hours may be fatal. The prognosis depends upon the man who first sees the case.

Acute Intestinal Intoxication.

Acute intestinal intoxication is a shock-like condition which results from the absorption of toxins from the gastro-intestinal tract. The toxin is probably of a split-protein nature. The intoxication is practically always preceded by diarrhœa. The outstanding symptom is progressive drowsiness, accompanied by vomiting. Pallor or cyanosis may result from the effect of the toxin on the circulation. The liver is usually enlarged. The treatment consists in the withdrawal of all food, and the oral, intravenous, and subcutaneous administration of glucose until the drowsiness has been absent for one or two days. Gradually increasing quantities of two per cent. lactic acid milk may then be offered. If the drowsiness is marked a transfusion of blood is indicated. In very severe cases an exsanguination-transfusion is a life-saving procedure. The mortality even with the best of treatment is very high.

Mongolian Idiocy and Cretinism.

These conditions of defective mental development are frequently not differentiated by the family physician. The vast majority of Mongolian idiots are referred with a diagnosis of cretinism. A survey of the records of this hospital show that Mongolian idiots are encountered more frequently, as during the past five years forty-three Mongolian idiots were admitted and only twelve cretins. the facies of the Mongolian idiot is quite characteristic. The eyes are almond-shaped, and slant downwards and inwards. The epicanthic fold is marked. These characteristics become more evident when the child cries. The tongue usually protrudes, and only in this respect does the appearance of the Mongolian idiot resemble the cretin. In a number of cases the external ear is crinkled, due to maldevelopment of the cartilage. Congenital defect of the heart or palate is frequently present. The head tends to be flattened from before backwards. The hands are short and stubby, and the little finger is frequently curved inwards ("baseball finger"). Hypotonicity of the body is marked and the feet can readily be placed behind the head. These infants are subject to frequent head-colds, and usually die of a broncho-pneumonia during the first two years of life. No treatment improves the condition.

Cretinism is the result of a congenital deficiency or absence of the thyroid secretion. The features are coarse. The skin is dry and doughy but does not pit on pressure. The nose is broad, the lips thick, and the jaw heavy. The tongue is large and protuberant. The

whole face presents the appearance of having been pushed back, with the force applied at the bridge of the nose. The hair is coarse and wiry. The extremities are short. The temperature tends to be subnormal.

The administration of thyroid extract produces a marked improvement in from one to two months. This treatment has to be continued throughout life. The dosage at first is usually about one half a grain three times a day, which is not increased as long as the patient shows physical and mental improvement. If necessary as much as 10 to 15 grains may be given daily.

Evidences of over-dosage are, increased perspiration, pallor, prostration, and an abnormally high pulse rate. Although the physical development may become normal these patients are always mentally backward.

Heart Murmurs.

Heart murmurs may be divided into three groups, congenital, functional, and acquired. The congenital heart murmur is present from birth. It is loudest over the base or body of the heart, and the intensity varies from the very faintest sound to the loud "machinery" type of murmur. The intensity of the murmur bears no relation to the severity of the lesion. Enlargement of the heart takes place to the right. Functional murmurs also occur over the body of the heart and are not transmitted. Although the exact cause is not known they are usually considered to be the result of changes in the blood due to anæmia, or to dilation of the heart as the result of some febrile condition. They are always of a very soft blowing systolic character and frequently disappear on exercise. Indeed, they tend to disappear spontaneously. Examinations over a long period may be necessary in order make a definite diagnosis. Acquired heart murmurs differ considerably from the above mentioned conditions. A point of very great practical value in the differential diagnosis is that acquired heart disease is quite rare under four years of age. The character of the acquired heart murmur in children is the same as in adults. The murmurs most frequently encountered are systolic in time, heard best at the apex, and transmitted towards the left. A history of sore throat, rheumatism, or chorea is usually obtained.

Otitis Media.

Inflammation of the middle ear is a condition which is frequently overlooked. During the past five years no less than 2,094 cases were encountered in the medical services of this hospital. The frequency of this condition in infancy is due to the prevalence of upper respiratory infection, in conjunction with the short straight Enstachian tube of infancy which allows easy access of the infecting organism to the middle ear. The presence of otitis media should always be considered in any infant with an unexplained fever, as this may be the only symptom. Usually, however, the infant is irritable. As a result of the infection a gastrointestinal disturbance may develop. The infant practically never indicates the presence of pain in the ears. If the resistance of the patient is low, there may be little or no elevation of temperature. Otitis media is invariably secondary to a nasopharyngitis. Accordingly, the ears should always be watched carefully in any upper respiratory infection. Examination is most readily made by means of an electric auriscope. If the drum is reddened the condition may be treated by the administration of 1 to 2 drops of warm Keith's dressing in the ear every 4 hours. If bulging occurs, paracentesis is indicated, followed by dry wiping or syringing.

Pyelitis.

Pyelitis is an infection of the pelvis of the kidney, which in severe cases extends into the kidney substance itself, producing a pyelonephritis. The symptoms are, a high widely fluctuating

temperature with a sudden onset, frequently preceded by a chill, and occasionally a convulsion. There are frequency of micturition and loss of appetite. A history of frequency is difficult to obtain in infancy. In severe cases the patient becomes quite toxic. The physical signs are usually negative, but occasionally large tender kidneys may be palpated. A definite diagnosis can only be made by a microscopical examination of an uncentrifuged specimen of urine. The urine may be collected in the male by strapping an ordinary test tube on the penis. With the female, a female infant urinal, or an ordinary glass bird-seed container may be held against the vulva by the diaper. Examination of the urine shows the presence of a large number of pus cells. Occasionally due to the blocking of a ureter, the pus cells appear intermittently. Therefore, it may be necessary to examine two or three specimens, before the pus is found.

The age and sex incidence of the disease is of interest. Eighty per cent. of the cases encountered at this hospital occurred in females, and more than 50 per cent. of the cases were infants from three to eighteen months of age. The disease is uncommon under three months. The treatment consists in the administration of sufficient potassium citrate to make the urine alkaline. This may require from 40 to 300 grains per day. The average case requires 15 grains to 25 grains dissolved in 2 drachms of water, and administered 5 times per day, at an interval of 4 hours. The urine must be kept alkaline for a period of about one year, otherwise the disease will recur.

Ammoniacal Diaper.

The chief symptom of this condition is the presence of free ammonia in the wet diaper. Frequently, the ammonia is so strong that it "makes the eyes water" when the diapers are being changed. As a result of the local irritation produced by the ammonia there may be excoriation of the buttocks and genitalia; indeed, in many cases the infant is brought to the physician on this account. The condition is due to decomposition of the urea and ammonium salts in the urine with the resultant liberation of ammonia. The whole process takes place in the diaper after the urine is passed. Different theories have been advanced to explain this condition. Some authors believe it is due to the presence of certain bacteria in the diaper which act rapidly on the urea and the ammonium salts with the liberation of ammonia. Other writers consider the ammonia the result of the action of traces of strong soap left in the diapers. The question is not settled at the present time.

The treatment is very simple. One-third of a teaspoonful of baking soda (sodium bicarbonate) is given daily in each of three feedings. This results in the replacement of some of the ammonium salts in the urine by sodium salts. The amount of fat in the milk should be reduced, as this diminishes the amount of acids excreted in the urine. These acids frequently require ammonia to neutralize them. The diapers after being washed should be soaked for an hour or two in a saturated solution of boracic acid. They should then be thoroughly rinsed before use. This both sterilizes the diapers and removes any trace of soap. If these measures are carried out the odour of ammonia almost invariably disappears. The excoriated areas on the skin should be washed with olive oil, and then covered with cornstarch. Exposure of the parts to the air facilitates healing.

Retropharyngeal Abscess.

This disease, which is not uncommon, is almost invariably overlooked, in spite of the fact that it can be readily diagnosed. During the past year 11 cases were admitted to this hospital, practically all of which occurred during the winter months. It is usually encountered in children less than two years of

age. The condition is an acute inflammation of the retropharyngeal glands, which are situated on both sides of the midline posterior to the pharynx. It is always secondary to nasopharyngitis. The prominent symptoms are noisy, snoring respirations with the mouth open, and retraction of the head. These symptoms are due to pressure on the larynx. An external swelling below the angle of the jaw is almost invariably present. The disease can only be diagnosed with certainty by palpation with the finger in the mouth. If no teeth are present a gag is unnecessary. A circumscribed mass can be felt on the posterior pharyngeal wall just lateral to the midline. Some cases of retropharyngeal adenitis do not go on to abscess formation. When definite fluctuation is present, the mass should be incised. The use of either an anæsthetic or an external incision is positively contraindicated. The patient, pinned in a blanket, is laid on the back with the head extending over the edge of the table. A month gag is inserted. It is essential that the knife used be wrapped with adhesive so that only the terminal eighth of an inch of the blade is left unguarded to penetrate the tissues. Guided by the left index finger, a transverse incision is made across the most fluctuant portion of the mass. The knife is withdrawn and the index finger rapidly inserted in the opening and any adhesions broken down. The child is immediately turned on its face to allow escape of the pus. The procedure as outlined must be carried out rapidly, in order to prevent the aspiration of pus. Convalescence is rapid.

Exanthem Subitum or Roseola Infantum.

This disease occurs usually in infants less than eighteen months of age. The onset is abrupt, beginning with a high fever of a fluctuating nature which persists three to four days. Usually on the fourth day, the temperature falls by crisis, and there appears a pink maculo-papular rash which persists for one to three days. As the rash fades there frequently appears a fine branny desquamation. The disease is contagious and there is complete absence of complications or sequelæ.

Exanthem subitum occurs most frequently in the late summer and early autumn, and during the winter months. The fever ranges from 101° to 105°, with a tendency to morning remissions. The patient, in spite of the high fever, is usually carefree and happy which is of considerable diagnostic importance. The catarrhal symptoms of measles are absent. There may be slight congestion of the throat, conjunctiva, and buccal mucous membranes. Usually on the second or third day of the febrile period there occurs a general glandular enlargement, though often only the cervical and posterior auricular glands are involved. In many cases the enlargement of these glands persists for weeks. On the third to fifth day of the disease the fever falls by crisis, and usually coincident with this the rash appears, at first on the trunk, then spreading to the neck, face, posterior auricular regions, and the proximal half of the extremities. It is a bright pink or rose coloured maculo-papular rash. The maculo-papules in some cases coalesce, which may make the rash almost indistinguishable from that of measles. The spots disappear on pressure. After one to three days, the rash fades, frequently leaving a fine branny desquamation. A characteristic blood change is the presence of a leucopenia, with 70 to 85 per cent. of lymphocytes.

There is no other exanthem in which the eruption is consistently coincident with defervescence, and with the disappearance of all signs of illness.

Dental Infection and Systemic Disease.

J. WALLACE GRAHAM, D.D.S., 3T3.

Focal infection, especially of the structures of the mouth and upper air passages, is a very prevalent condition. The evidence of infection of the mouth is enormous everywhere, the two common forms being pyorrhea aveolaris and alveolar abscesses.

The discovery of a relationship between ill health and defective teeth is by no means recent. It has received casual mention in the older literature and has been independently recognized for centuries by practitioners of Medicine and Dentistry. Probably the first reference is in Olmstaed's History of Assyria in the seventh century B.C., in which the king is told by his physicians that his teeth must be extracted to remove the pains from his head and limbs. It is interesting also to note a few significant lines taken from reports published by Benjamin Rush, M.D., in 1801. In one case after relieving dyspepsia by extraction of teeth he states:

From the soundness of the external part of the tooth and the adjoining gum there was no room to suspect that a discharge of matter from it had produced the disease in his stomach.

In another case:

I find that it is not necessary that teeth should be attended with pain to produce disease.

Pyorrhea and alveolar abscesses are conditions incident to all classes of adults. They are much less prevalent in the young. They are diseases which fundamentally involve the periosteum of the tooth and are the chief causes of the loss of permanent teeth.

The chief etiological factors are:

1. Micro-organisms — streptococcus, pneumococcus and staphylococcus groups.
2. Chronic irritation.
3. Conditions which prevent normal massage of gums and cleaning of teeth.
4. Constitutional conditions which increase susceptibility of gums to infection, namely—diabetes, pregnancy, lactation, alcoholism, lead poisoning, use of mercury and potassium iodide in therapy, blood diseases, acute infectious diseases, etc.

These and other traumatic agents make the gums less resistant, pyogenic bacteria gain entrance, retroaction of soft tissue follows and the root of the tooth becomes involved. This periosteum, injured or destroyed, there follows softening and ulceration of the soft parts with the end result of acute or chronic alveolar abscess. Besides this infection through pyorrheal erosion of the alveolar process, the abscess may originate from the root canal of teeth with infected pulp. It is interesting to note while discussing these sites as primary foci, that recent observations by some English authorities would indicate that the apical ends of teeth and also tonsils are often the seats of secondary infection.

Of these two conditions alveolar abscesses are of greater pathologic import than pyorrhea as far as general health is concerned. Alveolar abscesses lack drainage. In pyorrhea drainage is often good. Alveolar abscesses are blind and their localization in bony tissue renders them a more serious detriment to health than septic foci of equal size in soft tissues such as gums where expansion is possible. Also, pyorrhea gives rise to symptoms which immediately attracts patient or dentist. whereas alveolar abscesses may give no symptoms which would lead one to suspect their existence.

The frequent occurrence of oral sepsis, the frequency with which other infections coexist and the frequency with which patients give a history of having had one or more severe acute infectious diseases make it difficult or

impossible from statistics to determine the exact role which dental disease plays in the etiology of systemic troubles, but it is interesting to note that

Thoma found alveolar abscesses in 88 per cent. of patients in one hospital who were suffering from chronic disease. Irons reports 44 per cent. with alveolar abscesses. Black reports alveolar abscesses at the roots of 47 per cent. of devitalized teeth. Duke reports in the examination of one thousand cases bone absorption at roots of 81 per cent. of non-vital teeth.

From the pus and dead material of alveolar abscesses and the infected pulps of teeth cultures yield streptococci, chiefly viridans and hemolyticus, staphylococcus aureus and albus, fusiform bacilli, and other less important bacteria. These bacteria present in the infected areas are the important factors in the causation of general infection. The spread occurs in three ways:

1. By direct extension to adjacent tissues.

2. By transportation along mucous or serous surfaces.

3. By metastatic infection through the medium of the blood stream and lymph with final involvement of distant organs.

The intoxication is usually hematogenous. The bacteria may be compared with emboli loosened from the place of origin and carried in the blood stream to the smallest and often terminal blood vessels. If virulent and endowed with specific elective pathogenic affinity, which Rosenow suggests is developed in the primary focus, and if in sufficient numbers the invading bacteria will excite characteristic reactions in the infected tissues and a train of morbid anatomical lesions. The clinical phenomena which follow are dependent upon the type and virulence of the bacteria, the character of the tissue and the function of the organ involved. The specific tissue reaction consists of a local inflammation with endothelial cell proliferation of the lining of the blood vessel with or without thrombosis; blocking of the blood vessels, haemorrhage into the immediate tissue, positive chemotaxis with resulting multiplication of the leucocytes and plasma cells in the infected area or fibrinoplastic exudate with local connective tissue overgrowth.

Duke lists the following diseases, often streptococcic in origin, which may originate as a metastatic infection from chronic foci such as pyorrhea alveolaris and alveolar abscesses. Rheumatic fever, acute and chronic infectious arthritis, myositis, bursitis, neuritis, iritis, and other inflammatory diseases of the eye, vegetative endocarditis, ulcerative endocarditis, myocarditis, pericarditis, phlebitis, peritonitis, chorea, spinal myelitis, meningitis, acute and chronic nephritis, acute and chronic appendicitis, cholecystitis, gastric and doudenal ulcer, pancreatitis, thyroiditis, erythema nodosum, herpes zoster, osteomyelitis, periostitis, pneumonia, pleurisy, empyema, septicemia, erysipelas, cellulitis, lymphadenitis, etc. The ill effects of the lesions frequently appear clinically to be out of all proportion to their size, a fact which may be explained by their frequent occurrence in the form of blind abscesses, by their frequent localization in osseous tissue which allows no expansion and finally by the frequency with which the infected areas are exposed to pressure transmitted by the teeth during mastication.

All infectious foci of the teeth may be associated with secondary infections of the lymph nodes of the neck and mediastinum. Kretz records 600 autopsies with special reference to the infection of cervical lymph nodes, and stated that in 90 per cent. the glands showed streptococcus infection. These lymph node infections may disappear with the removal of the primary focus or may persist actively as new foci in the production of systemic disease or the infection of nodes become permanently latent.

A focus of infection may also have a great influence upon the course of unrelated diseases. Marked improvement upon the course of tuberculosis has followed the removal of abscessed teeth. In individuals with syphilis affecting the nervous system an overwhelming number were found to possess alveolar abscesses, and in cases reported patients were improved to a very marked degree by the removal of enlarged tonsils and abscessed teeth. In a review of cases this seemed to be particularly evident in cases of Tabes Dorsalis and General Paresis. The removal of focal infections as part of the routine in the treatment of syphilis is also of value in facilitating the use of mercury and potassium iodide and in rendering their use less harmful, as these drugs have been found to cause trivial infections to develop rapidly into definite toxemias.

It seems probable that much of the ill-health which is cleared up after the adequate treatment of the dental repairs is due to a low form of septicemia in which the organisms cause no definits secondary focus until the part is damaged. A powerful, robust man of 40 years of age was forced to spring quickly back to a curb to avoid injury. In doing so he slightly strained his left knee. Three days later he was admitted to the hospital suffering from acute suppurative synovitis of his knee joint —the leg was eventually amputated. The interesting point is that there was no external injury. After an examination of the whole body the source of infection was finally found in the mouth. He had an advanced pyorrhea alveolaris with deep pockets streaming with pus around his teeth. The strain had evidently lowered the vitality of the tissues in the joint and allowed an invasion of organisms from the blood stream.

In respect to secondary localization there are diverse opinions as to why the invading bacteria secondarily infest this or that tissue or organ. The more important suggestions offered by Rosenow are:

1. That the number of diseases caused by streptococci is greater than was formerly supposed.
2. The streptococci may acquire affinities for certain tissues in many instances remarkably specific.
3. That streptococci may change in their selective affinities, morphology and cultural characteristics and biologic reactions after cultivation in artificial media or after growth in animal tissues. Rosenow also states that members of the streptococcus-pneumococcus group may develop affinities for certain tissues while growing in primary foci. He then makes the interesting deduction that since bacteria, which have grown in given tissues acquire an affinity for that tissue the likelihood of such organisms to involve other structures is slight. W. L. Holman claims on the other hand that there are sources of error in Rosenow's experiments and that there is overwhelming evidence that the determining factors in the localization of invading or injected bacteria are the local conditions in organs and tissues. While mentioning the bacteriology of the process it is interesting to note the views of Barker of Johns Hopkins, who states that the mere presence of bacteria in a pulpless tooth or in the tissues about it cannot be regarded as sufficient evidence that the body is being injured by such bacteria or even menaced by them. He recalls that the skin and mucous membranes of the mouth, nose and paranasal sinuses, tonsils and pharynx, respiratory and gastro intestinal tract always contain bacteria, so one may perhaps be less afraid of bacteria in gums and in pulpless teeth. Barker thinks the view worth considering that such bacteria may be of advantage in maintaining and increasing the powers of the normal defensive mechanisms of the body.

The relatively rare evidence of systemic disease as compared with the

marked prevalence of focal infection may be answered by well known facts concerning natural and acquired immunity. The natural defences of the body due to the bactericidal and antiseptic powers of the tissues, blood plasma cells, etc., protect the majority from the acute infectious diseases, but all individuals do not possess an equal degree of immunity and some more readily succumb to the invading infectious agents. Physical and mental exhaustion, starvation, exposure to cold, debility and alcoholic dissipation, narcotics and exhausting general disease may reduce the natural resistance. Pasteur found that the marked immunity of the chicken to anthrax could be overcome by lowering the body temperature by immersion of the fowl in cold water. Undoubtedly the latest pathogenic bacteria are able to invade the host because of lowered resistance and added virulency. Organisms harboured in such chronic foci of infection as alveolar abscesses are held local a large part of the time. They repeatedly find the defences of the body below par, however, and find abundant opportunity to multiply rapidly, invade the blood stream and gain lodgement in distant structures.

Unusually a focus of infection is disregarded by the patient unless it cause local discomfort. It is only when pain or destructive lesions of gum make the condition evident, that diagnosis is made. When a systemic disease occurs which present day knowledge associates with a focus of infection the site must be tested. The character of the disease may point to the most likely location of the primary portal of infection and where alveolar abscesses are suspected diagnosis is made by radiographs. Very little can be determined of their existence or extent except by this means. A few believe that areas as shown in radiographs are proof of past infection but do not believe that they can be looked upon as active infection but the general concensus of opinion seems to be that teeth showing areas at the apex are active foci. To determine whether a particular tooth is the cause of a particular disease is the problem.

There seems to be no difference of opinion on the broad principles of getting rid of points of infection which are known to be detrimental to health, but differences arise on:

1. Presence of infection in rarefied areas at apices of teeth.

2. Methods of getting rid of such infection.

3. Consequence of such infection.

In general what determines the removal of a tooth in the mouth is the health of the patient as determined by the physician and the condition of the peridontal membrane as determined by the dentist. All patients suffering from active diseases should not have left in their mouths any point of infection, even if it involves the loss of every tooth; on the other hand robust, healthy patients of good family history may have many infected teeth treated by conservative methods with great comfort and benefit. The extraction of the infected teeth frequently causes acute reactions in infected organs but the good eventually derived usually far outweighs the ill. The removal of foci has terminated fatally in a few cases, so that the technique of removal should be a kind which will not overwhelmingly innoculate the patient. Often the inflammatory process, arthritis for example, may continue long after the primary focus has been removed. This may be due to the fact that the organisms have produced local pathological changes which are favourable to their growth, and in part to the fact that organisms in their struggle for existence in the tissues may acquire the faculty of protecting themselves against the defensive mechanism of the body. Either factor might render their complete eradication difficult.

The study of the exudates, tissues and bacteria is important, but the most important principle is to know the physical condition of the patient. Following the diagnosis the management includes:

1. Removal of all primary and, if necessary, all secondary foci of infection.

2. To build up the natural defences of the body by rest, proper nourishment ,etc.

3. Hydrotherapy, diathermy, passive exercise, etc.

Deplorable as the loss of teeth may be in the removal of these foci, that misfortune is justified if it is necessary to obliterate the infectious focus which is a continued menace to the general health.

Acute Appendicitis With Generalized Peritonitis: Case Report.

J. W. A. GREIG, 2T9.

Inflammation of the vermiform appendix is the most important acute intestinal disorder (Osler). The following case of Acute Appendicitis with General Peritonitis is made as one might encounter in the general practice of medicine.

D. H. is a Scotsman, aged 27, employed as a mechanic for the Bell Telephone Co.

On Friday night he retired feeling fine but on Saturday, January 5th, 1929, at 5 a.m. he was awakened suddenly by terrific stabbing pains in the epigastrium. The pain caused the patient to lie on his back, draw his knees to his chin and rock in agony on the bed for over an hour, when he took some whiskey, which dulled the pain. A doctor was called about 8 a.m., who diagnosed ureteral colic and administered a hypodermic of morphine. The pain recurred as the effect of the morphine wore off, three or four times during the day, and each time the doctor returned and repeated the hypo. The patient stated the pain "dropped" gradually toward the perineum and settled "beneath the testicle." On Sunday it varied at times localized in the perineum and at other times diffused over the lower abdomen, and it was much worse during the day than at night. At no time did he complain of pain over the right lower abdomen as is commonly the case. About 9 a.m. Saturday, four hours after the onset of pain, following a drink of water, the patient vomited at first clear then bile-stained fluid. Vomiting was frequent after that, occurring almost every hour throughout Saturday and Sunday, or whenever he took a drink of water. On Sunday, when the attending physician pressed his hand deeply over the patient's right lower abdomen, he elicited great tenderness in that region. Sunday night between 7 and 8, about 40 hours after the onset of his illness, the patient was removed to St. Michael's Hospital.

His past history reveals that while in Scotland, during the war, he had several attacks of indigestion consisting of dull gnawing pain in the epigastrium and vomiting but these he attributed to "war bread." In May, 1928, the patient remembers one attack of acute pain across the abdomen in the region of the umbilicus lasting four days, which, however, did not prevent him from working. During the last eight months, since he has been on the night shift, he has noticed that his intestinal tract has not been functioning as well as formerly. Occasionally he has had slight pain beneath the costal margin on both sides and has been constipated at these times. Headaches are fairly frequent.

Physical examination showed him to

be a young adult male, well-developed, and well-nourished but pale and nervous with an anxious expression and apparently suffering acutely. His temperature was 98° and pulse 88. The abdomen was held immovable and suggests a voluntary rigidity. Both recti stood firm and hard. It took all the strength of the wrist to elicit deep tenderness over the caecum. Distraction of attention lessened the rigidity. Slight tenderness was present superficially over the whole abdomen.

On rectal examination tenderness was elicited on the right side. No masses were felt.

The urine was scanty in amount, Specific Gravity 1020, otherwise negative. The white cell count of the blood was 21,000 per cubic millimetre.

A diagnosis of acute appendicitis was made and the patient had his operation at 10 o'clock Sunday night. Through a right groin incision an acutely inflamed appendix was removed. The abdominal cavity contained much free sero-purulent fluid, which was drained by two tubes through the same incision. The patient was returned to the ward, a continuous interstitial of normal saline started, and hot linseed poultices applied continuously to the abdomen.

The pathologist reported that the sections of vermiform appendix showed widespread destruction of mucous coat. The whole wall was oedematous, haemorrhagic and very densely infiltrated by polymorphonuclear leucocytes.

The post-operative treatment and progress notes are as follows:

Jan. 7th. T. 100 P. 100 R. 20. Continous interstitial; linseed poultices to abdomen. Morphine for pain as required. At night patient complained of gas pains. Rectal tube inserted.

Jan. 8th. T. 101^1, P. 92, R. 22. Abdomen shows considerable distension, and the patient is uncomfortable. The tongue is coated but moist, ½cc pituitrin and a 1, 2, 3 enema given at 11.15 a.m. At 4.30 p.m. pituitrin repeated and milk and molasses enema given. Interstitial and poultices continued.

Jan. 9th, **9 a.m.** T. 100 P. 74 R. 18. Abdomen markedly distended. With pituitrin and milk and molasses enema slight amount of flatus was expelled. The patient is definitely more toxic and condition is unsatisfactory.

1 p.m. Pituitrin and 1, 2, 3 enema given. Much flatus expelled but still distended. Spasmodic pains in abdomen and vomited greenish fluid.

4.30 p.m. No further cramps. Sore all over abdomen, and bathed in perspiration. Has anxious facial expression and has been hiccoughing and retching.

5.30 p.m Very toxic, tongue dry and coated. Delirious.

6.00 p.m. With the patient lying on his right side, buttocks and shoulders were elevated and knees drawn to chin, leaving the area of 4th dorsal vertebra as the most dependent segment. Lumbar puncture was done about 10cc. of cerebrospinal fluid being allowed to flow from needle into a sterile vessel containing 50 milligrams of ½ per cent. novocaine. The novocaine dissolved directly and the mixture was returned to the spinal canal by means of a liver syringe, 10cc. of spinal fluid were again withdrawn without disconnecting the syringe and immediately returned, thus mixing the fluid in the patient. Within a few minutes the patient noticed tingling in the toes, feet, legs and thighs. He was somewhat irrational and it was not possible to determine the level to which the anaesthetic extended upward. One half hour after injection, the patient had a large involuntary bowel movement. The interstitial was discontinued and a continuous intravenous injection of normal saline substituted. T. 102 P. 80 R. 44.

Eserine gr. 1-50 and Pituitrin ½cc. were prescribed 9. 2. h. alternately and morphine gr. ¼ for pain.

Jan. 10th. T. 99^4, P. 76, R. 18. Patient is still considerably distended.

Pituïtrin and 1, 2, 3 enema given. Complains of pain in abdomen. At night condition seems slightly improved.

Jan. 11th. T. 99³, P. 62, R. 22. Linseed poultices, intravenous saline, pituitrin and eserine, and enemas at intervals. Passed a fairly comfortable day. Orange juice and broth allowed by mouth.

Jan. 14th. T. 98, P. 60, R. 20. Patient is comfortable. Very slight distension. Tongue is moist and condition deemed satisfactory.

Jan. 20th. T. 99¹, P. 64, R. 22. The patient is comfortable and general condition is improving rapidly. He is feeling very fit. Boracic compresses applied to slightly discharging wound. On full diet.

The interesting features of this case are first, the history which is fairly typical but shows how one may be misled by a variation in the position of the pain. (Read Osler and MacRae and Gask and Wilson on Appendicitis); second, the use of spinal anaesthetic in the treatment of ileus. The probable explanation of the effect of spinal anaesthesia in ileus is that the splanchnic inhibitory reflexes are blocked so that the vagus motor reflexes have full play. (Read "Spinal Anaesthesia" in S. G. and O. for December, or read D. M. Greig on "Spinal Anaesthesia in Treatment of Ileus in Edinburgh Medical Journal for 1927.)

The treatment in this case was under the direction of Dr. Harold Armstrong, surgeon on the staff of St. Michael's Hospital.

The Present Treatment of Varicose Veins

In the clinics about Toronto the practice of injecting varicose veins with various sclerosing substances seems to have taken firm hold. Linser of Tubingen, Germany, originated the method in 1912. Ulcers or eczema do not interfere with the treatment, but nephritis and previous thrombosis of the deep veins does. Small sloughs may occur which may be allowed to separate, or require excision under local anesthesia. This is said to be in no way a dangerous complication. A transient edema of the foot is fairly common. Local recurrences are less common and less severe than after varicotomy, and are to be treated with additional injections. All foci of infection should be removed.

Of the preparations used hypertonic saline (30%) appears especially favored. One to 2c.c is injected at several points along the varicosed veins course. Some use a 1:500 solution of metaphen, injecting it every day until all varicose veins are obliterated. The successive doses are 6, 9, and thereafter 12 c.c. Saline cathartics are not to be given with mataphen. Others prefer a solution of quinine, urea and saline. In any case, the thing desired is thromboses as a result of internal damage by the solution used. The injections are preferably given with the patient standing, or the legs hanging over a table edge. The patient is advised to keep off his feet as much as possible after a treatment.

The advantage of this technique over varicotomy is obvious, and it now appears to be an accepted procedure.

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EDITORIAL.

Daffydil. The committee on Daffydil is doing hard, conscientious work this year to make Daffydil the success that it well deserves to be. We are sure that the entire Faculty of Medicine will strongly aid this committee in every way possible. Don't forget the dates, February 21st and 22nd.

The New Pathology Building. The new pathology building being constructed on College street opposite the main entrance to Toronto General Hospital will be a new step forward in the history of our faculty. The very complete report in the last number of the University Alumni Bulletin, by Dr. Stanley E. Ryerson, will well deserve careful reading. The feature that particularly appeals to the students will be the housing of the clinical years in one building, and that every effort is being made to expand the Departments of Surgery and Medicine through the use of special laboratories and equipment. The careful planning and arrangement of this new building is a credit to the Faculty.

The Interne Problem and the Loss of our medical graduates is the subject of a very interesting report in the January number of the Canadian Medical Association Journal, by Dr. G. Harvey Agnew, Secretary, Department of Hospital Service, of the Canadian Medical Association. The report shows that interne facilities in Canada are better than ever before; that there is an increasing demand for internes in Canada, and that the explanation for the shortage of internes to fill this demand apparently is

that our Canadian graduates go to the States. The statistical study on Toronto graduates is of interest: "The University of Toronto has kept statistical data on this subject for several years. For the last seven years, out of 1,102 graduates, 408, or 37 per cent, took their internships in the United States. The peak was in 1924, when 88 out of 210, or 42 per cent., crossed over to American hospitals. Each year a number of the graduates do not report their whereabouts or intentions. If these were deducted from the list, as they should be, the percentage would be considerably higher.

Class of	1922	1923	1924	1925	1926	1927	1928
Total	161	209	210	123	181	110	108
Internes in Canada ...	50	58	67	55	77	57	53
Internes in United S..	52	81	88	41	68	43	35
Uncertain ..	24	39	26	12	10		
Percent. in United S..	32	39	42	33	38	39	32½

Dr. Agnew is doing excellent work in acquainting the graduating year with the opportunities in Canadian hospitals. One would do well to consult him at the C.M.A. offices.

Back Numbers. There is abundance of the November and December, Volume II., 1924 numbers. Look over your files, and if you haven't these numbers, write for them.

We have several demands for any numbers of volume I. We will pay 40c. a copy for a limited number. We will also buy the following numbers of Volume III., November, December, January, and April.

We wish to remind our subscribers that the University Press will bind a volume of the Journal at $1.50 apiece.

Faculty News.

ART. WALKER, 2T9.

Daffydil, annual stunt and frolic night, sponsored by the Medical Society, is being held in Hart House Theatre, on the evenings of February 21 and 22. In rather marked contrast to more recent years is the enthusiasm shown by those participating in the performance. Already the various years have spent considerable time rehearsing skits, and an able committee, headed by G. H. Hutton, has arranged all but last minute details.

This year's committee took an important step towards making the affair a first-class production when they secured the Hart House Theatre instead of Convocation Hall, the rather inappropriate background of previous performances. Another feature this year is the employment of a professional director to manage and assist in the staging of each of the year skits.

Epistaxis, edited by R. M. Mitchell, will be another of those cartoon numbers such as were made famous by "String" Biehn, 2T5 and "Casey" McCarthy, 2T6.

The Senior Medical At-Home, the Medical Society's annual formal dance was held on February 1st in Hart House and was largely attended. The large gym was appropriately decorated for the occasion. Those under whose patronage the dance was held were Dean and Mrs. Primrose, Dr. and Mrs. W. B. Hendry, Dr. and Mrs. E. S. Ryerson, Dr. and Mrs. G. S. Young.

The committee were: S. V. Railton (chairman), G. H. Hutton, C. E. Vaughan, T. R. Sarjeant, E. D. Barner, and J. W. Sinclair.

Members of the graduating year were entertained by the Fellows of the Academy of Medicine on the evening of January 24. Dr. W. W. Jones, who presided, in the absence of Dr. F. W. Marlow, President of the Academy,

welcomed the students and introduced the speaker, Prof. C. R. Fay, of the Department of Economics.

Prof. Fay spoke in a very interesting manner of early medical conditions in England and pointed out the part the improved medical technique played in the successful outcome of the industrial revolution. The new methods, it was shown, were the results of discoveries made by the illustrious Jenner, Pasteur, Lister and other less widely known celebrities of early English Medicine.

Representatives of the Medical Society at recent dances have been, H. R. Ziegler, at the annual McGill Medicine Dance; R. M. Mitchell, at the At-Home of the Aesculapian Society, Queen's; and R. M. McKeown at the Forestry Ball. J. R. Lind will represent the Society at the School At-Home and G. H. Hutton at the Arts Ball.

Mr. R. H. Greer, K.C., was the speaker at the third of the Medical Society's series of afternoon meetings, held in the main lecture hall of the Anatomy Building on January 28. The attendance was the largest in years and was proof positive of the popularity of the present system whereby open meetings are held in the evening from five to six o'clock.

In dealing with his topic, "The Doctor In Court," Mr. Greer related from his large legal experience, instances in which doctors have innocently found themselves at variance with the law, and he took occasion to warn his hearers of the pitfalls into which medical men are most liable to fall. The great care which must be exercised in dispensing and prescribing narcotics was emphasized particularly. "There is one point which I specially wish to stress and if you remember it always, I will feel that my talk has done some good. It is this—never at any time, give anyone, not even your best friend, narcotics in any form for self administration. Remember that so long as you administer the narcotic yourself, you need have no fear of the Drug Act, but the minute you give any person, for any reason, a narcotic to take from your office and administer to himself, you become liable to a jail term." Mr. Greer added that it made no difference whether the person was known to be an addict.

The assembled members of the Medical Society were strongly advised to become conversant with the Medical Health Act, and it was pointed out that for a dying declaration to be valid in a court of law, the deceased must have known before making the declaration that he was at the point of death.

Mr. Greer concluded with a brief outline of the legal aspect of insanity.

Ambroise Pare, Master Barber-Surgeon.*

Ambroise Paré was born in the village of Bourg-Hersent in France about 1510. At this time the professions of surgeon and physician were kept apart by the law of the Church, which forbade a physician to shed blood. Paré trained as a barber-surgeon, serving first an apprenticeship, followed by a term of three or four years as a house surgeon with the Hôtel Dieu in Paris. He then set up in private practice in that city but during the numerous periods of war he was to be found following the army as a private surgeon to various nobles. When he was seventy years of age he was attacked by the Dean of the Faculty of Medicine in Paris on account of his use of the ligature instead of cauterizating after amputation. In answer to this criticism Paré wrote "Journeys in Diverse Places," in which he tells of

* Quotations are from the Harvard Classics.

his experiences and successes as an army surgeon. This work is most interesting not only in its medical aspect but also because it gives a vivid picture of the military life of the sixteenth century.

The accepted method of treating gunshot wounds at this time was cauterization. Paré states that he had read in John de Vigo: "Of Wounds in General," that wounds made by firearms partake of venemosity, by reason of the powder; and for their cure he bids you cauterize them with oil of elders scalding hot, mixed with a little treacle. He started out by using this treatment but soon discovered that less heroic methods were attended by better results. To quote: "At last my oil ran short, and I was forced instead thereof to apply a digestive made of yolks of eggs, oil of roses, and turpentine. In the night I could not sleep in quiet, fearing some default in not cauterizing, that I should find the wounded to whom I had not used the said oil dead from the poisons of their wounds; which made me rise very early to visit them, where beyond my expectation I found that those to whom I had applied my digestive medicament had but little pain, and their wounds without inflammation or swelling, having rested fairly well that night; the others, to whom the boiling oil was used, I found feverish, with great pain and swelling about the edges of their wounds. Then I resolved never more to burn thus cruelly poor men with gun-shot wounds."

The army surgeons of this period realized the advisability of removing foreign bodies such as bullets whenever possible. Paré relates an instance of a nobleman receiving an arquebus-shot in the shoulder. The bullet was searched for by three or four of the best surgeons in the army who could not find it. "At last he called for me, to see if I could be more skillful than they, because he had known me in Piedmont. Then I made him rise from his bed, and told him to put himself in the same posture that he had when he was wounded, which he did, taking a javelin in his hand just as he had held his pike to fight. I put my hand around the wound and found the bullet. . . . Having found it I showed the place where it was, and it was taken out by M. Nicole Lavernot, surgeon of M. the Dauphin, who was the King's lieutenant in that army; all the same, the honour of finding it belonged to me."

In his "Journey to Metz, 1552," Paré describes the siege of Metz by the Emperor Charles V. The defenders, five or six thousand strong were ably led by Francis, Duke of Guise. Paré was sent to the field of action by the King, with drugs to be used in dressing the wounded. He gained entrance into the city by bribing an Italian captain of the Emperor's army, and was soon engaged in the duties of his profession. He describes a few of his cases and also gives a splendid account of the defence of the city. Some excerpts follow: "M. le Prince de la Roche-sur-Yon was the first who entertained me, and inquired what they were saying at the Court concerning the town of Metz. I told him all that I chose to tell. Forthwith he begged me to go and see one of his gentlemen named M. de Magnane, . . . who had his leg broken by a cannon-shot. I found him in bed, his leg bent and crushed, without any dressing on it, because a gentleman promised to cure him, having his name and his girdle, with certain words (and the poor patient was weeping and crying out with pain, not sleeping day or night for four days past). Then I laughed at such cheating and false promises; and I reduced and dressed his leg so skilfully that he was without pain, and slept all the night, and afterwards, thanks be to God, he was healed, and is still living now, in the King's service. The Prince de la Roche-sur-Yon sent me a cask of wine, bigger than a pipe of Anjou, to my lodging and told me when it was drunk, he would send me an-

other; that was how he treated me, most generously.

All the seigneurs within the town asked me to give special care, above all the rest, to M. de Pienne, who had been wounded while on the breach, by a stone shot from a cannon, on the temple, with fracture and depression of the bone. They told me that so soon as he received the blow, he fell to the ground as dead, and cast forth blood by the mouth, nose, and ears, with great vomiting, and was fourteen days without being able to speak or reason; also he had tremors of a spasmodic nature, and all his face was swelled and livid. He was trepanned at the side of the temporal muscle over the frontal bone. I dressed him, with other surgeons, and God healed him; and to-day he is still living, thank God.

The Emperor attacked the town with forty double cannons, and the powder was not spared day or night. So soon as M. de Guise saw the guns set and pointed to make a breach, he had the nearest houses pulled down and made into ramparts, and the beams and joists were put end to end, and between them faggots, earth, beds, and wool-packs; then they put above them other beams and joists as before. And there was plenty of wood from the houses in the suburbs; which had been razed to the ground for fear the enemy should get under cover of them, and make use of the wood; it did very well for repairing the breach. Everybody was hard at work carrying earth to repair it, day and night: MM. the princes, the seigneurs, and captains, lieutenants, ensigns, were all carrying the basket, to set an example to the soldiers and citizens to do the like, which they did; even the ladies and girls, and those who had not baskets made use of cauldrons, panniers, sacks, sheets, and all such things to carry the earth; so that the enemy had no sooner broken down the wall than they found behind it a much stronger rampart. The wall having fallen, our men cried out at those outside, "Fox, fox, fox," and they vented a thousand insults against one another. M. de Guise forbade any man on pain of death to speak with those outside, for fear their should be some traitor who would betray what was being done within the town. After this order, our men tied live cats to the ends of their pikes, and put them over the wall and cried with the cats, "Miaut, miaut."

Truly the Imperialists were much enraged, having been so long making a breach, at great loss, which was eighty paces wide, that fifty men of their front rank should enter in, only to find a rampart stronger than the wall. They threw themselves upon the poor cats, and shot them with arquebuses as men shoot at the popinjay.

Our men often ran out upon them by order of M. de Guise; a few days ago, our man had all made haste to enrol themselves in sallying parties, chiefly the young nobility, led by experienced captains; and indeed it was doing them a great favour to let them issue from the town and run upon the enemy. They went forth always an hundred or six score men, well armed with cutlasses, arquebuses, pistols, pikes, partisans, and halbards, and advanced as far as the trenches to take the enemy unawares. Then an alarm would be sounded all through the enemy's camp and their drums would beat "plan, plan, ta, ti ta, ta ta, ti ta, touf touf touf." Likewise their trumpets and clarions rang and sounded, "To saddle, to saddle, to horse, to horse, to horse, to saddle, to horse, to horse." And all their soldiers cried "Arm, arm, arm! to arms, to arms, to arms! arm, to arms, arm to arms, arm": like the hue and cry after wolves; and all diverse tongues according to their nations; and you saw them come out of their tents and little lodgings as thick as little ants when you uncover the ant-hill, to bring help to their comrades who were having their throats cut like sheep. Their cavalry also came from all sides at full gallop, "patati, patata,

patati, pa, ta, ta, patata, pata, ta," eager to be in the thick of the fighting, to give and take their share of the blows. And when our men saw themselves hard pressed they would turn themselves back into the town, fighting all the way; and those pursuing them were driven back with cannon-shots, and the cannons were loaded with flint-stones, and with big pieces of iron, square and three-sided. And our men on the wall fired a volley, and rained bullets on them as thick as hail, to send them back to their beds; whereas many remained dead in the fields: and our men also did not come back with whole skins, and there was always some left behind (as it were a tax levied on us) who were joyful to die on the bed of honour. And if there was a horse wounded, it was skinned and eaten by the soldiers, instead of beef and bacon; and if a man was wounded, I must run and dress him. Some days afterwards there were other sallies, which infuriated the enemy, that we would not let him sleep a little in safety.

M. de Guise played a trick upon them: he sent a peasant, who was none of the wisest, with two letters to the King, and gave him ten crowns and promised the King would give him an hundred if he got the letters to him. In the one letter M. de Guise told the King that the enemy showed no signs of retreating, and had put forth all their strength and made a great breach, which he hoped to defend even at the cost of his own life and all who were in the town; and that the enemy had planted their artillery so well in a certain place (which he named) that it was with great difficulty he could keep them from entering the town, seeing it was the weakest place in the town; but soon he hoped to rebuild it well, so that they would not be able to enter. This letter was sewed in the lining of the man's doublet, and he was told to be very careful not to speak of it to any person. And the other letter was given to him, wherein M. de Guise told the King that he and all those besieged with him hoped to guard the town well; and other matters which I leave untold here. He sent out the man at night and he was taken by the enemy's guard and brought to the Duke of Alva, that the Duke might hear what was doing in the town, and the peasant was asked if he had any letters. He said "yes," and gave them the one, and they having seen it asked him if he had not another. He said "no." Then he was searched and they found on him that which was sewed to his doublet; and the poor messenger was hanged and strangled.

The letters were taken to the Emperor, who called his councils, where it was resolved, since they had been unable to do anything at the first breach, the artillery should forthwith be set against the place which they thought weakest, where they put forth all their strength to make a fresh breach; and they sapped and mined the wall, and tried hard to make a way into the Hell Tower, but dared not assault it openly."

The Emperor having announced that he would never depart from the town till he had taken it by force or by famine though he should lose all his army the French prepared to resist the besiegers to the last man. A series of barricades were constructed in the event of a breach being made in the wall. If these strongholds were overcome the enemy was to be attacked by seven great companies, each led by one of the princes. It was the resolve of the defenders to burn all their treasures in the great square lest the enemy should make trophies of them, to stave in all the wine casks; and to set fire to all the houses. When the Emperor heard of all this he decided to raise the siege and go away; which he did, much to the delight of the French.

The enemy left behind many dead. Paré makes some half humorous, half serious comments on this. "I would return to the reason why so many of them died; which was mostly starvation, the plague, and cold. For the

snow was more than two feet deep upon the ground, and they were lodged in pits below the ground, covered only with a little thatch. Nevertheless each soldier had his camp bed, and a coverlet all strewed with stars, glittering and shining brighter than fine gold, and every day they had white sheets, and lodged at the sign of the Moon, and enjoyed themselves if only they had been able, and paid their host so well over night that in the morning they went off quits, shaking their ears: and they had no need of a comb to get the down and feathers out of their beards and hair, and they always found a white tablecloth, and would have enjoyed good meals but for the want of food. Also the greater part of them had neither boots, half-boots, slippers, hose, nor shoes: and most of them would rather have none than any, because they were always in the mire up to mid-leg. And because they went barefoot we called them the Emperor's Apostles."

These are a few of the experiences which Paré relates in his "Journeys in Diverse Places." There are numerous others of a highly interesting character, especially to students of medicine.

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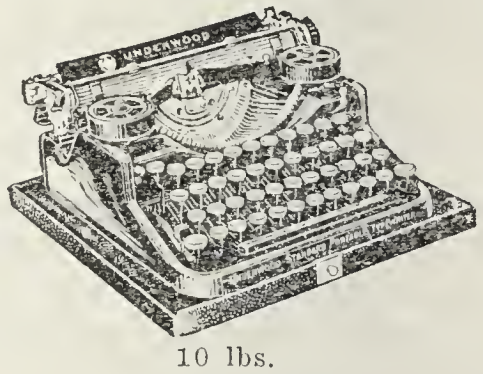

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